

Abstract

Predetermined non-uniform residual compressive stress distributions are induced in the spring wire of metallic coil springs. The residual compressive stress tends to reduce deleterious effects of both fatigue and coil binding impacts on spring performance. Transverse cross-sections of coil spring wire reveal non-uniform distributions of residual compressive stress that exhibit substantial symmetry about various transverse axes, including axes connecting potential or actual opposing coil binding contact points on the spring wire surface. Residual compressive stress in coil spring wire of the present invention may also vary in a predetermined manner when measured longitudinally along the coil spring wire.